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SOVIET DEFENSE INTERCEPT CAPABILITY BY THE USE OF RADARS

1. This subject is being treated in two parts: (a) the technical characteristics of USSR radars, and (b) a distribution of ground radars within the USSR and its Satellites. Attachment 1 is a list of the technical characteristics of Soviet and Satellite radars with the ELINT Staff Officer's ideas on the best way to use this data and Attachment 2 is a list of radars in use today in various portions of the USSR and its Satellites.

2. The technical characteristics give approximate powers, frequencies and antenna configurations from which the reader may calculate or have calculated by any competent electronic scientist, the antenna patterns to be expected. This calculation produces a reliable estimate of the intercept range against a given target at a given altitude. Time does not allow making these calculations before presentation of this paper. This point is discussed further in the cover sheet to Attachment 1. Although airborne, height finding and gun-laying radars are included in the attachments, it is not believed necessary to include these when evaluating the Soviet capability to intercept approaching aircraft. Their mode of operation and technical characteristics does not give them a high probability of intercept unless directed by some early warning or GCI radars. It should also be remembered that by far, the bulk of the height finding and gun-laying radars are in the S-band 2700-3100 Mc/s.

3. As a first approximation in answering the question posed by the title, one notes from Attachment 2, which is a distribution of radars geographically, that one would expect to be observed by KNIFEREST, DUMBO and/or RUSS type radars in the 70-85 Mc/s region in any part of the USSR and its Satellites with the exception of a part of the large land mass of central Siberia and central China. In addition, one would expect to be observed by the Soviet 2700-3100 Mc/s TOKENS in the same areas excepting the northeastern coastline of Siberia. The next most likely intercept radar is the 212 Mc/s CROSSFORK (patterned after the SCR-602) which is used fairly heavily in the western USSR Satellites, particularly in Hungary. These same 212 Mc/s radars would be likely, although not so likely as in the European Satellites, to intercept aircraft along the eastern Siberian coastline and the Near East-USSR border. In China, one finds a significant quantity of 90-120 Mc/s and 140-170 Mc/s ancient early warning radars still in use that would be expected to intercept aircraft. The very, very few 600 Mc/s ground-based radars that have been observed are believed to be inactive and not to be considered as significant intercept devices in any part of the USSR and its Satellites.

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4. In summary, one needs to be concerned with 2700-3100 Mc/s radars, the most notable one of which is the TOKEN and the 70-85 Mc/s KNIFEREST and DUMBO at almost any point of entry of the USSR as well as within the USSR and with the 212 Mc/s CROSSFORK in Hungary and East Germany with spotty intercept possibilities in the other Western USSR Satellites, the Near East and the eastern Siberian coast. 90-120 Mc/s and 140-170 Mc/s radars would be expected to intercept aircraft entering China, Manchuria and Korea from their Pacific coasts.

5. The Soviet ship-borne air search radars are in three classes: the 86-94 Mc/s group (copies of British-types 960 and 281), the 205-235 Mc/s group known as SEAGULL, CROSSEBIRD and the British-type 291 and the S-band group 2825-2850, known as HAIRNET and SEAGULL. The other naval radars are either fire control or surface search and would not be expected to intercept invading aircraft unless directed by one of the above listed equipments. It is noted then, that to include naval capabilities, in the summary of Paragraph 4, one extends the 70-85 Mc/s band to 94 Mc/s and the 212 Mc/s band will be extended to 205-235 Mc/s.

6. It is recommended that specific studies be made on the possibility of entering the USSR at specific points. These studies should, in addition to considering Attachment 2, analyze carefully the National Technical Processing Center ELINT reviews, the latest copy of which is No. 2-57, dated 24 July 1957 (published quarterly) and SAC's most recent Order-of-Battle in order to include up-to-date information. It is believed possible to enter the USSR in any area other than the strip from the Baltic to Rumania with careful planning and have a high probability of avoiding the 212 Mc/s CROSSFORK. It is barely possible that one might enter through Czechoslovakia. It is not possible to avoid KNIFEREST at any point on the USSR border and one could avoid TOKENS only on the northeastern Siberia-Pacific Ocean coast.

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